

Applicant No.: 10/776,176
Reply to Office action of November 19, 2007

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Amendments to the Claims :

Please amend the claims by replacing the claims currently on file with the following listing of claims:

1.-61. (Cancelled)

62. (Currently amended) An apparatus for separating a particle stream into a first particle group and a second particle group, said apparatus being connectable to a positive pressure source, said apparatus comprising:

- a dilution treatment chamber defining a passageway, said passageway being substantially upstanding and defining a passageway top end and a substantially opposed passageway bottom end, said passageway top end defining a particle inlet and said passageway bottom end defining a first-particle-group outlet for releasing the first particle group, said passageway being configured and sized to receive the particle stream at said particle inlet such that the particle stream falls toward said first-particle-group outlet;
- a transfer casing located substantially adjacent to said dilution treatment chamber, said transfer casing defining a transfer chamber provided for receiving the second particle group;
- at least one transfer aperture substantially laterally positioned with respect to said passageway, said transfer aperture extending between said transfer chamber and said passageway and allowing fluid communication therebetween, said at least one transfer aperture including an uppermost transfer aperture, said passageway and said transfer chamber being separated from each other by a wall above said uppermost transfer aperture for preventing said particles from said particle stream falling in said passageway from entering said transfer chamber above said uppermost transfer aperture;

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- a distributor located in said passageway between said particle inlet and said transfer aperture, said distributor being provided for substantially breaking down the particle stream and distributing the particle stream substantially horizontally within said passageway, said distributor including a fluid-injection nozzle defining a distributor aperture laterally positioned in said passageway, said distributor aperture being located above said uppermost transfer aperture, said fluid-injection nozzle being connectable to the positive pressure source for injecting a jet of the fluid in said passageway through the distributor aperture for distributing the particle stream over a surface area of said passageway; and
- at least one fluid flow aperture provided in said dilution treatment chamber for creating a substantially horizontal fluid flow in said passageway, said at least one fluid flow aperture and said transfer aperture being located below said distributor substantially horizontally aligned relatively to each other and located substantially opposed to each other relatively to said passageway, said fluid flow aperture being connectable to the positive pressure source to create the fluid flow;
- whereby the fluid flow pushes ~~allows to entrain~~ the second particle group out of ~~from~~ said passageway through said transfer aperture and into said transfer chamber with the first particle group remaining in said passageway for exiting through said first-particle-group outlet.

63. (Previously presented) The apparatus according to claim 62, further comprising a pre-treatment module located substantially above said particle inlet, to guide the particle stream and to cause a horizontal dilution of the particle stream.

64. (Currently amended) The apparatus according to claim 63, wherein said pre-treatment module has at least one slide portion sloping downwardly toward said particle inlet for guiding and accelerating the particle ~~a-particle~~ stream towards said dilution treatment chamber, and a deflecting surface located between said slide and said particle inlet for breaking down the particle stream and for imparting the dilution to the particle stream.

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65. (Previously presented) The apparatus according to claim 62, wherein at least one of said fluid flow apertures is usable to inject a fluid additive into the particle stream.
66. (Previously presented) The apparatus according to claim 62, wherein said dilution treatment chamber and said transfer casing share a wall separating said passageway and said transfer chamber from each other.
67. (Previously presented) The apparatus according to claim 66, wherein said fluid flow aperture is defined by at least one separation nozzle provided for projecting a fluid jet, said separation nozzle including an adjustable gate selectively movable across said fluid flow aperture for controlling a rate and pressure of the fluid jet projected from said fluid flow aperture.
68. (Currently amended) The apparatus according to claim 62, wherein said distributor ~~includes a distributor aperture laterally positioned in said passageway, said distributor aperture being defined by a fluid-injection nozzle tapers in a direction leading towards said distributor aperture substantially adjacent said distributor aperture adapted to be connected to the positive pressure source and connected to the distributor aperture for injecting fluid in said passageway for distributing the particle stream over a surface area of said passageway.~~
69. (Currently amended) The apparatus according to claim 62, wherein said distributor aperture is substantially elongated and oriented such that said distributor aperture extends over a greater extent horizontally than vertically ~~distributor is either an impeller, an ultrasound system, or a reciprocating strainer.~~
70. (Currently amended) The apparatus according to claim 62, further comprising a recuperation tray, positioned within said transfer chamber passageway below said transfer aperture for collecting particles of the first particle group deflected or forced out of said passageway by the flow of fluid, and for returning the collected particles towards said passageway particle inlet, in the remainder of the particle stream.

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71. (Previously presented) The apparatus according to claim 62, wherein said transfer chamber has an outlet at a bottom end thereof, for collecting the second particle group received in said transfer casing.

72. (Previously presented) The apparatus according to claim 62, wherein said transfer chamber is segmented into laterally adjacent upstanding receptacles to further separate the second particle group according to the distance over which the particles of the second particle group are entrained by the flow of fluid.

73. (Currently amended) A method for separating a particle stream into particle groups, comprising:

- vertically diluting the particle stream by directing the particle stream into a falling condition within a passageway and accelerating the particle stream under the action of gravity;
- horizontally diluting the particle stream by distributing the particle stream by subjecting the particle stream to high pressure fluid flow creating lateral forces so as to distribute the particle stream over a surface area of said passageway with said particle stream remaining confined inside said passageway;
- projecting a particle group away from a remainder of the particle stream and outside of said passageway by creating a fluid flow of predetermined magnitude across the particle stream in said falling condition; and
- collecting the particle group and the remainder of the particle stream at separate locations.

74. (Currently amended) The method according to claim 73, further comprising a step of substantially horizontally diluting the particle stream by providing a horizontal velocity to the particle stream prior to vertically diluting the particle stream.

75. (Previously presented) The method according to claim 73, wherein distributing the particle stream includes injecting a fluid flow into the particle stream to distribute the particle stream over the surface area of the passageway.

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76. (Previously presented) The method according to claim 73, wherein collecting the particle group and the remainder of the particle stream at separate locations includes collecting the particle group into at least two particle subgroups by providing a first collecting location for collecting the separated particle groups, and a second collecting location for collecting the remaining particle stream in the passageway, so as to collect particles in the subgroups according to the predetermined magnitude, the predetermined magnitude influencing the quantity and traveling distance of entrainment and projection of the particles.

77. (Previously presented) An apparatus according to claim 62, wherein said passageway has a substantially parallelepipedic configuration.

78. (Currently amended) An apparatus according to claim 77, wherein ~~said dilution treatment chamber and said transfer casing share said wall separating said passageway and said transfer chamber from each other, said dilution treatment chamber also including a movable wall to which said nozzle is attached, said movable wall is being~~ substantially horizontally movable so as to allow a variation in a cross-sectional area of said passageway.

79. (Cancelled)

80. – 90. (Cancelled)